Do Your Learners Do the Thinking?

DEVELOPING LEARNERS'
HIGHER-ORDER THINKING SKILLS
IN ENGLISH/READING FOR GRADES 7, 8, 9 & 10

MENTOR'S GUIDE

A Professional Learning Package on the
PPST Indicators 1.5.2 and 1.5.3

This Mentor's Guide in English/Reading for Grades 7, 8, 9 & 10 was developed
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INTRODUCTION TO THE MENTOR'S GUIDE

Hello, dear Mentor! Welcome to this
Professional Learning Package in English/Reading!

This *Mentor's Guide* was developed to complement the *Teacher's Resource*. This has been created from the item bank and *Teacher's Resource* on PPST indicators 1.5.2 and 1.5.3.

This is intended for you – master teachers and school leaders – to coach and further support our teachers effectively and, at the same time, collaborate with them. Collaboration among teachers and school mentors are essential to enhance the teaching and learning process. This 'team-up' approach suggested in this resource aims to help build better communication and interactions among staff as you learn from each other.

As a highly proficient practitioner, you have an important role to play in the achievement of the intended learning outcomes stipulated in the materials. Likewise, your participation in this endeavor will assist your mentees acquire the skills, knowledge, attitude, and values as they advance their career level.

Note: **The Teacher's Resource in English/Reading includes 70 assessment items involving 158 individual questions.**

Both the *Teacher's Resource* and this *Mentor's Guide* are appropriate for use in Learning Action Cells (LAC), classroom applications, and mentoring, among others, as complementary materials.

Mentoring Instructions

To assist you in the role, you may refer to these mentoring instructions:

Read the teacher's resource. It is important to read the item bank and teacher's resource to understand the background upon which the material is built, and know learn the main pointers teachers can acquire while preparing their teaching plan and dealing with their student learners.

Set a one-on-one session. This session is simply a chance for teachers to deal with what they have learned by sharing their thoughts and having constructive and complementary discussions with another person.

Ideas for Mentors:

Using the items in LACs might include:
- Initially, selecting a single Item/or Item set to use to introduce the structure and features of the package to mentees
- Suggesting as small set of items around a single topic for mentees to try before a next LAC session, so the whole group can feedback and share ideas on the same set of items.
- Discussing the full range of HOTS strategies being modelled in the resource.
- Asking mentees to identify an item of interest to review, try with their students, evaluate and then report back to their group
- Leading your LACs group to identify some general strategies that support HOTS, e.g., *building questions up in a topic from unistructural to multistructural to relational*; or *using open questions and scaffolds*.

Ideas for Mentees:

Using the items:
- Trying some items themselves to reflect on their knowledge and understanding
- Trying some item with their students – maybe some in early grades and some in higher grades
- Sharing some items with their school colleagues – this could be useful for collaborative discussions; clarifying the focus the school has on the Philippine Curriculum that they are currently implementing
- Adapting or developing some items for your school's context.

Further or complementary study:
- Reading more about HOTS
- Exploring PISA competencies and PISA testing and how they might be used in your school

How to use the Mentor's Guide?

This *Mentor's Guide* provides an outline of how you may support your teachers. The following are provided in this material:

Capacitating my Mentee on the SOLO-based Assessment Items

Provides activities and/or outlines a work plan for the master teachers, school heads, and supervisors to coach and mentor teachers about the identified strategies in the *Teacher's Resource.*

Reflection Log

Provides opportunities for the master teachers, school heads, and supervisors to assist teachers in reflecting on their teaching strategy, the **S**tructure of the **O**bserved **L**earning **O**utcome (SOLO) model, the challenges they encountered, and how they addressed the challenges that arose.

As a mentor, you need to make sure that the teachers who are using the *Teacher's Resource* have an understanding of its purpose and the content provided in the Philippine Professional Standards for Teachers (PPST) **Domain 1: Content Knowledge and Pedagogy** (Strand 1.5).

This is also a chance for you to undertake the following:

- Clarify important points indicated in the key learnings and the guide below.
- Provide feedback based on how teachers answered the items or activities.
- Ask for and confirm changes in teacher perspectives and teaching plans.
- Initiate and conduct individual and group discussions you think are necessary and relevant.

Capacitating my mentee on the

SOLO-based Assessment

Activity 1. Organizing LAC Session

Introduction

The content of the *Teacher's Resource* can be used to engage teachers in collaborative learning sessions such as the Learning Action Cell (LAC). Both mentors and teachers should be given the chance to share insights and expertise in teaching higher-order thinking skills to learners. Similarly, it is vital that teachers share the challenges encountered during the teaching-learning process so that, with your guidance and support, these challenges can start to be addressed.

Being able to master the **S**tructure of the **O**bserved **L**earning **O**utcome (SOLO) model requires reading, discussion and practice. While the ideas may sound straightforward, both you and your colleagues (mentees) require hands-on activities to help comprehend the model.

It is interesting that as you spend more time on SOLO, new brain-based perspectives associated with teaching and learning open up. In the following mentoring activities, you will begin applying the SOLO model to current pen and paper questions. These can serve as diagnostic, formative or summative activities employed in classrooms.

An important characteristic of the SOLO Model is a series of levels that measures increasing sophistication (quality) in responses to questions directed to learned tasks. There are five levels of response in the Basic SOLO Model, but three are most relevant to the work undertaken in the teacher resource.

The reader is encouraged to read and analyse the work provided in the following, Activity 2, for a much fuller appreciation of Basic SOLO and the SOLO levels. However, as an initial introduction the three levels used to classify responses are referred to as unistructural, multistructural and relational where:

A **unistructural** response involves one relevant operation or action from the stimulus;

A **multistructural** response involves several relevant independent operations or actions;

A **relational** response integrates all relevant pieces of information and operations from the stimulus.

These three levels comprise a U-M-R **cycle** of development, and offer an important pedagogical tool for teachers to assist them in planning instruction and assessment.

Getting Started First Time

An introduction to the HOTS Teacher's Resource

First in conversation with the teachers choose a question from a subject area in English/Reading from the Teacher resource. Teachers might suggest a preferred question to start.

Teachers may wish to start with an item from English/Reading and Grade 7. They may wish to choose Item 001.

Now talk through the first page (see a copy below). This information situates the item in the Philippine Curriculum as expected taught content and also the related PISA competency. It also describes briefly the HOTS thinking strategy employed in the question.

Item 001	Subject:	English
	Grade Level:	7
	Topic:	Sequencing of Ideas
	PISA Competency:	*Hierarchize or condense information at a local level (identifying the main idea, summarizing, or giving a title)*
	Possible Mapping to K to 12:	Sequence/reorganize ideas or information (EN7RC-IV-e-2.10)

Next move onto the questions. Most questions in this Resource have a STEM. A STEM contains information necessary to be able to undertake the question. It usually does not have a question within it.

Item 1 Grade 7 English: Sequencing of Ideas

Instructions: Read the paragraph carefully and answer the questions that follow.

Item 1 Eugene Dela Cruz is a young man who is beyond his years. Throughout high school, he studies hard and works his way to always be on top of the class, champions competitions he joins, and holds tutorial classes to make ends meet. Due to his lack of a home full of love, warmth, and support early on in his life, he has learned to get up and look for the circumstance he wants, and whenever he does not find it, he creates it. He capitalizes on building his strengths as his ultimate gateway to excellence rather than dwelling on his weaknesses. Consequently, he has repeatedly proven himself and the world – that one's mess of life could be turned into art – a masterpiece of battle scars!

This paragraph is the STEM for the question. This STEM sets the scene or situates the learner in the area in which the questions are to be answered.

What follows in this item are three questions, Question 1.1, Question 1.2, and Question 1.3 based around SOLO levels. The expectation is that students will be able to respond up to a certain level and after this, the student will make mistakes or be unable to process the question adequately.

Note: All questions relate back to the STEM in some way. Also, the question difficulty (in terms of SOLO) increases as the learner proceeds through the item.

Teachers should be given the Item and the four questions. Teachers should work with a partner and discuss each question and write down what they think an appropriate correct response would be provided by a student. They may also consider what incorrect responses students might make in the different question parts.

Once all teachers, either singly or in pairs, have completed all items than teachers as a group should work their way through the answers comparing the responses they think students would make.

When this is done we will now go more formally through each question part and teachers would agree on the answer for the first part. Disagreements should be clarified.

Question 1.1 Grade 7
Unistructural Item: *Find 1 piece of evidence from the text that shows that the author wants the reader to admire Eugene.*

Your Answer:

Then the SOLO level for the response and the question should be discussed and reasons found to justify the SOLO level.

The process will now proceed to the second question part.

Question 1.2 Grade 7
Multistructural Item:

List down how Eugene has overcome the obstacles he faced.

Your Answer:

Question 1.3. Grade 7
Relational Item:

Which of the following ideas does the text most support?
Justify your answer.

- If you dream big, you can achieve anything.
- Life is full of obstacles, but if you work hard, you can be successful.
- The circumstances of your birth and upbringing can determine your success
- Eugene's life is a lesson we can all learn from.
- Eugene has successfully turned his life into a work of art.

Your Answer:

Question 1.1 Unistructural

He is an optimistic person.

Question 1.2 Multistructural

He does not give up no matter how difficult the circumstances are,
- He studies so hard and works his way to always be on top of the class,
- He champions competitions he joins, and
- He holds tutorial classes to make ends meet.

Question 1.3 Relational

The text supports the idea, "Life is full of obstacles, but if you work hard, you can be successful." Regardless of the circumstances, you are born within this life, your attitude towards overcoming obstacles may determine your success in life. Based on the text, Eugene has proven time and again that no matter what or how hard the obstacles are, he has always believed in himself and has worked hard not only to overcome them but to come out much better and more successful.

An Example from Grade 8: Focus on the Answer

Learning Competency: Use the appropriate reading style (scanning, skimming, speed reading, intensive reading, etc. for one's purpose (EN8RC-Ie-i-7).

Topic: Scanning for Information

Text STEM:

One of the specific problems discussed in India's schools today is the poor grading system. It appears to put more emphasis on 'pen and paper' examination results. The message it delivers to learners is that academic exam results matter in getting a good education with too much focus on theories and less on the application or practical component. Most courses or subjects offered in schools value theories more than life skill applications, which are more permanent and beneficial for learners, especially when they reach the stage of employment. In short, learners are tested and graded more on their knowledge of theories.

Question 2a: *Based on the text, what is the major problem currently faced by the Indian education system?*
   a.   The Indian education system
   b.   Poor grading system
   c.   Future employability of learners
   d.   Quality of education

Sample Answer to Question 2a:

   Option b, i.e., Poor grading system

Discuss the response and consider how relevant were the other (incorrect) options in the question. The multistructural question is as follows:

Multistructural question: Question 2b *What evidences provided in the text justify that the grading system in India does more harm than good?*

Sample answer to Question 2b: *The following evidences are mentioned in the text: academic exam results matter in getting a good education with too much focus on theories and less on the application or practical component; courses or subjects offered in schools value theories more than life skill applications; and, learners are tested and graded more on their knowledge of theories.*

Discuss the response and consider the number of separate pieces of information provided in the question. The relational question is as follows:

Relational question: Question 2c: *How important is it for learners to recognize the value of the practical application of the academic courses/subjects they learn in school?*

Sample answer to Question 2c: *Understanding life skill applications, which are more permanent and beneficial for learners, especially when they reach the stage of employment is crucial. Theories learned in school are only as good when learners are able to apply them in real-life circumstances. Knowledge of theories and how they apply to different situations can help learners in the future determine a course of action to resolve problems or anticipate better resolutions.*

Discuss the response and consider why the answer is relational. How has the answer integrated or seen relationships between different separate pieces of information provided in the question. The sample extended abstract question is as follows:

Extended abstract question: Question 2d *To what extent is getting good grades important?*

Sample answer to Question 2d: *The main point presented in the text is valid. Of course, putting more weight on life skills is important so that learners like me will be able to apply things learned in school in the real world. But getting good grades or targeting a certain grade point average is equally significant since it can help student scholars maintain their scholarship and possibly get a new grant when they pursue a college education. It has to be noted that grades are one of the measures for most academic scholarship grants.*

Discuss the response and consider why the answer is extended abstract.

Having teachers think about the questions and not just the answers

Allow your mentee(s) to analyze the questions you have presented in order. Ask them to describe it. Let them build the idea but guide them by processing the answers they will provide.

Note: Just because a questions is designed to seek (say) a relational response from a student, this does not mean the student might respond at that level. It is not uncommon for a student to provide a unistructural response (focus on one thing aspect) or a multistructural response (focus on a number of separate aspects) answer. Also, a student might not understand the question asked at all and provide a pre-structural response (irrelevant or completely wrong) for an answer.

Describe **Question 2a? from a SOLO perspective.**

Expected Teacher Response: The question has a specific answer (a closed question) and in SOLO terms it is unistructural. Learners are expected to provide **only one** correct answer.

Now, prepare a multistructural level question and present it to your mentees.

Describe **Question 2b from a SOLO perspective?**

This time, allow them to analyze Question 2b and compare it with Question. 2a.

Expected Teacher Response: Unlike the original question, the revised question requires more relevant, separate pieces of information to answer the question; thus, multistructural. Learners can provide more than one piece of information. The number of pieces of information will vary from teacher to teacher. Clearly a response that contains say three **correct** pieces of information is better than one that contains two. Nevertheless they are both coded as a multistructural response.

Describe **Question 2c from a SOLO perspective?**

Once again, allow them time to analyze the Question 2c and compare it with the earlier questions.

Expected Teacher Answer: The revised question is now open-ended and at the relational level. Like the multistructural question, learners can provide multiple answers. But this time, they must identify the connections among the aspects they presented.

This time the focus is on the extended abstract level question, Question 2d. For the last time, allow them to analyze the question and compare it with the previous questions.

Describe **Question 2d from a SOLO perspective and compare it with earlier questions?**

> **Acceptable answer:** The question is now open-ended and at the extended abstract level. Like the relational question, learners can link and explain several ideas related to the topic. But this time, they can also link these to other bigger ideas and concepts not necessarily mentioned or implied in the text.

HANDS-ON ACTIVITY
Overtime and after teachers have had experience with a number of Activities and Questions, and tried some with their students, you will help your mentees in formulating questions using the SOLO model. 1. As a mentor, provide a learning competency to your mentee(s). 2. Let them prepare questions on the unistructural, multistructural, relational, and extended abstract levels. 3. Review the questions they formulated. Provide comments and suggestions on how your mentee(s) can improve the questions they formulated. 4. If you are mentoring two or more teachers, it is a good idea to have a peer review of outputs. 5. Give them time to revise their outputs before the final review of the questions.

Activity 2. Introduction to the Basic SOLO Model

Enclosed is a summary of the Basic SOLO Model. Teachers have access to this in the Teacher's Resource in Science. It is reproduced below. This will help guide your thinking as well as establish baseline information for you and your teacher colleagues. It is worth stressing that there is more to the SOLO model but this is designed to be an entry into SOLO-type thinking, especially as it is related to ideas about learning quality – in particular, a practical classroom based operational thinking related to lower-order and higher-order thinking.

This Introduction, in four Parts, to the basic SOLO Model was written by Professor John Pegg of the SiMERR National Research Centre in Australia. The aim is to situate the reader within the early, and still highly relevant, research and thinking that has been undertaken on SOLO so as to provide a stronger base for the reader in assessing learner responses. This is particularly relevant in the case of explaining lower-order and higher-order thinking.

Part 1 Background to SOLO

The SOLO Model (the SOLO Taxonomy) of John Biggs and Kevin Collis (Biggs & Collis 1982, 1991; Pegg 2003, 2020) is a cognitive (brain-based) developmental framework that offers a useful tool to explore the quality of a learner response in a specific context. The notion of 'quality' is not unfamiliar in Education discussions, its importance is seldom challenged. However, trying to tie down a meaning for quality and what it means operationally has shown not to be so easy.

At its basis, SOLO is interested in describing the nature of a learner response to a question or stimulus. This information offers insights into what a learner knows, understands and can do, as well as directions along which instruction may most profitably proceed.

When asked the 'quality' of a student's learning, a common response is to mention the number of facts or pieces of relevant information a person knows something about. This information might be further supported by citing scores on a recent examination, or the number of correct items a person has achieved in some test/quiz.

Such descriptions of 'quality', definitely offer a perspective on learning performance – a view that knowledge creation is about acquiring more and more pieces of information. In terms of operationalizing 'quality', this description can result in predictable and routine approaches to instruction involving drill and practice. However, this view can also limit a breadth of practices in teaching involving more demanding higher-order practices such as analysis, explanation, and synthesis, and that may lead to unfortunate long-term consequences for a learner.

Being told that a student obtained a score of 73% on a test tells us very little about the quality of the learning, except that the student probably knows more than someone who achieved 63% on the same test and not as much as someone who scored 83%. However, little can be interpreted if the comparison was with a person who achieved 70-72% OR 74-75%.

Data are clear that tests are often limited in their ability to discriminate meaningful student learning on scores within a few percentage points of one another. The impact of misguided interpretations of learning is even more dramatic when scores hover around the 50% mark. A mark which usually holds an unprecedented and undeserved importance by society.

Also, there are often issues interpreting student scores when students obtain the same score. Do similar scores on a test mean that students have the same questions correct or incorrect? Ideas of equivalence can be misleading. It is possible, for example, that one student earned their marks on the most straightforward questions across the test, while another respondent might be able to achieve correct responses on some quite difficult questions in certain areas and perform poorly in other areas.

It would seem quite likely that a student who is able to respond to some more difficult questions is likely to be able to advance more quickly with support, than a student who is only able to undertake the more basic questions correctly.

Further, and more importantly, numeric descriptions of quality do little to explain:
- what a learner knows or understands;
- in what directions a teacher, or the learner themselves, might move to improve or advance their learning; and, as importantly,
- how might this notion of 'quality' link to how the brain learns.

SOLO offers help in addressing these concerns. The focus of the SOLO categorization is on cognitive processes in addressing an issue or question rather than the end-products alone. SOLO offers a framework that enables explorations and descriptions of the quality of *'how well'* learning has progressed in different contexts. This provides a genuine balance to more typical approaches, mentioned earlier, that describe 'how much' is known.

The application of SOLO to the analysis of learner responses enables insights into learner cognitive development as well as understandings of possible cognitive blockages associated with the pattern of ideas that are impacting on leaner growth. As such, SOLO offers teachers insights into learner thinking and subsequent teaching actions.

Part 2 Overview of SOLO

Over the past 40 plus years, since the late 1970s, SOLO has built a substantial evidence base involving many thousands of research studies resulting in many hundreds of published articles. Now, SOLO has an extensive and growing universal following.

SOLO has emerged out as a consequence of describing learning through the eyes of a learner involving two separate but related activities. This involves:

- the acquisition or development of relevant ideas, facts, skills, concepts, processes and strategies; and
- the use of this acquired information in some form such as to solve problems, apply understanding, or explain or interpret meaning.

This reflects the two main ideas in Part 1 above concerning describing quality as 'how much' and 'how well'.

In terms of this current publication, this dual approach to thinking about 'quality' linked to SOLO, offers a realistic and practical description of what lower-order and higher-order thinking looks like as demonstrated in a learner's response.

In particular, SOLO enables teachers to distinguish between skills, knowledge and content that may be considered as lower-order functioning (or the result of surface learning) and those described as higher-order functioning (or the result of deep learning). SOLO supports teachers with ways to identify the practical meaning of lower-order and higher-order quality, and ways to identify examples in different contexts.

Such practical advice on applying decision skills, to distinguish lower- and higher-order functioning is achieved by describing an operationalized balance between:

(i)   the degree of complexity of how responses are structured by the brain; and
(ii)   relevant information associated with the content/context.

As lower-order skills and understandings are necessary pre-requisites for higher-order thinking, the ability of teachers to efficiently and effectively separate lower- and higher-order categorizations is a critically important skill. SOLO offers a structure upon which such decisions can be made.

This significant strength of the SOLO model lies in its links with neuroscience and how the brain learns, i.e., the cognitive (brain) processes. These brain-based ideas behind SOLO are linked to:

- information processing capacity, such as, working memory demands;
- the creation of neural pathways/networks through deliberate practice;
- the amount of information able to be retained by the learner in a particular domain; and,
- features specific to learning tasks or activities.

Overall, despite the obvious importance of the notion of 'quality' to education, descriptions of what is meant by quality have not received the attention, or use in practice, it deserves. SOLO offers an alternative to traditional assessment counts of 'how many', by placing SOLO center stage in learning and teaching. Teachers who learn to apply SOLO routinely in the classroom find that it is relevant and useful to understanding learning situations in all subject areas.

Further, when used correctly, SOLO can help teachers not only apply more *objective* and *systematic* assessment techniques, but it can help clarify developmental learning pathways to inform lesson and syllabus development, as well as strengthen formative-assessment approaches.

There are four main aspects to modern descriptions of SOLO. These are:
- SOLO levels
- the SOLO modes
- SOLO levels within modes
- SOLO cycles.

All four aspects are important for completeness, but initially, it is sufficient for the reader to become familiar with the meaning, use and application of the concepts around **SOLO levels (Section Part 3 below).** This feature is the one most prominent in early general discussions. Also, when information about SOLO is provided, say on the Web, the information provided on **SOLO levels** is usually the sole focus.

Part 3 Introduction to *SOLO Levels: Language and Meaning*

Biggs and Collis (1982) believe the way the brain structures learnt material, 'structural organization' of knowledge, is the difference between well learned from poorly learned material. It is this structural aspect of knowledge in the brain that underpins descriptions of quality. They (Biggs and Collis):

> believe that there are 'natural' stages in the growth of learning any complex material or skill... in certain important aspects these stages are similar to, but not identical with, the developmental stages in thinking described by Piaget and his co-workers. (Biggs & Collis, 1982, p. 15)

SOLO Levels
SOLO Levels are the most well-known aspect of the SOLO model. The SOLO levels describe the increasing sophistication (the increasing quality) of responses in handling certain tasks/questions relevant to a particular activity or domain. The levels are given specific names that every teacher needs to acquire and use accurately and consistently.

In the 1982 version of SOLO there are five levels of response. They represent a developmental continuum beginning from a level that describes an irrelevant or incorrect understanding, through a series of three levels describing how the brain structures understanding to an acceptable degree, to a fifth and final level where a response extends beyond what might typically be expected as an acceptable response.

Unistructural, Multistructural and Relational levels
In what follows the middle three levels are described first, and the first and last of the five levels are considered second. The three middle levels have the names unistructural, multistructural and relational. The names are almost self-explanatory. Their level descriptions are:

A *unistructural* (U) response is one where the focus is on a single attribute. It might involve writing a single sentence with one main idea, or undertaking one algorithm, or providing one reason or suggestion, or identifying one relevant piece of information from the stimulus, etc. The key to this level is in the name. The prefix 'uni' stands for 'oneness'. So, the 'structure' of the response is a single aspect that is relevant to the question or activity.

Response Structure (1982)

Unistructural
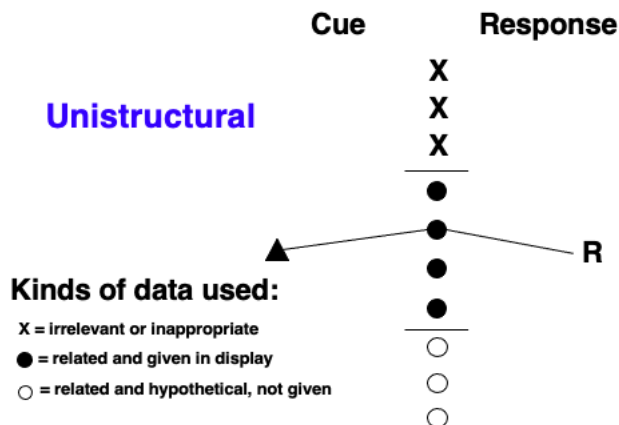
Cue   Response

Figure 1: Unistructural level

A *multistructural* (M) response is one that includes several relevant independent pieces of information from the stimulus or comprises a number (i.e., more than 1) usually sequential actions, explanations, algorithms, etc. The key to this level is in the name. The prefix 'multi' stands for 'many'. So, the structure of the response contains more than one aspect that is relevant to the question or activity. Further the different aspects are seen to be independent of one another. There is no integration of pieces of information or seeing inter-related aspects.

Response Structure (1982)

Multistructural
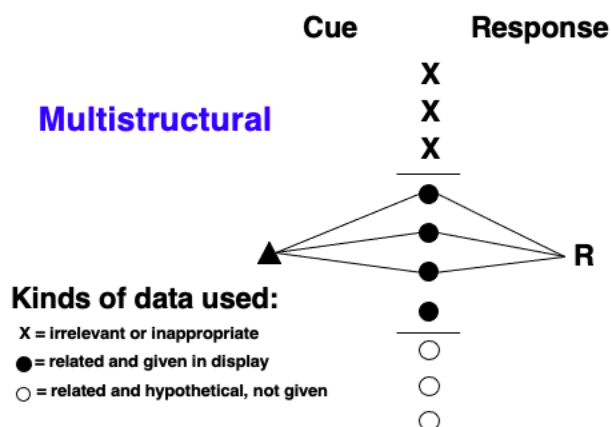
Cue   Response

Figure 2: the Multistructural level

A *relational* (R) response is one that integrates all relevant pieces of information or data from the   stimulus. These aspects in the stimulus are now linked to one another resulting in an overall coherence, a pattern, to the data presented and any approach to be undertaken. There is no inconsistency within the known system.

Response Structure (1982)

Cue   Response

Relational

Kinds of data used:

X = irrelevant or inappropriate
● = related and given in display
○ = related and hypothetical, not given
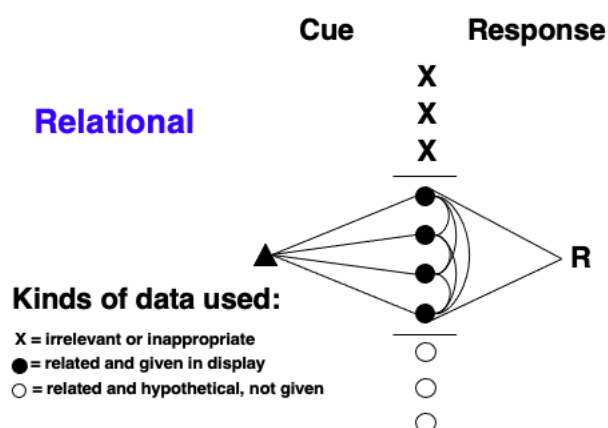
Figure 3: The Relational level

These three levels are often referred to as a SOLO unistructural–multistructural–relational cycle or a SOLO UMR cycle.

Original SOLO Taxonomy (Biggs and Collis, 1982)
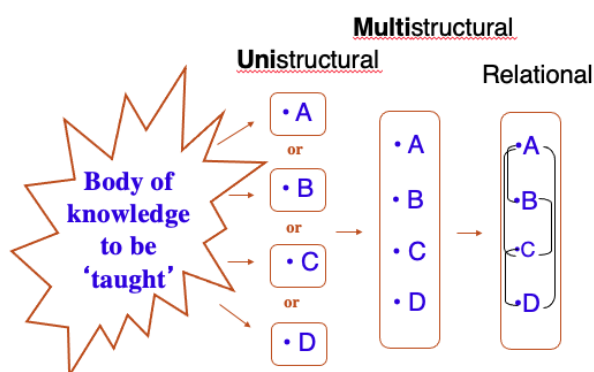
The three levels described above offer descriptions of increasing complex structures of thinking by the brain in which higher levels are directly built upon preceding levels, i.e., the mutlistructural response contains the unistructural response, a relational response identifies the relationships among the separate elements of the multistructural response. Taken together, the three levels represent a SOLO UMR cycle.

Prestructural and Extended Abstract levels

Two other SOLO levels can be found in the literature. They are most relevant to and used when people talk about the SOLO Taxonomy based around the 1982 book. The names of the two levels are prestructural and extended abstract.

The prestructural level, as the word indicates, occurs 'pre' or 'before' the structure starts and so it is used to code responses that fail to address a relevant feature. Such a response is described as:

A prestructural level (Pre) of response is one that does not focus on the relevant question or activity. Usually, the answer is quickly given with little thought. The answer is likely to be irrelevant or simply repeat information already provided in the question or activity.

Basic Response Structure (1982)

Figure 4: The Prestructural level

The extended abstract level, as the word meaning indicates, occurs after a relational response. So, it is used to identify a response that goes beyond what might typically be expected. In such cases the answer would have a deeper perhaps more abstract feel, hence, the name.

An extended abstract (EA) response is one that goes beyond what was expected at the relational level. In school situations it can involve deduction, ability to close on situations not experienced. Answers can be held open or qualified to allow for logical alternatives.

Response Structure (1982)

Figure 5: The Extended Abstract level

The two outer levels, one below and one above the middle three levels, respectively, are named prestructural and extended abstract.

Finally, a useful question is: What are the variables that determine or underpin the level of response given by a learner? There are five.

The Degree of Abstractness: The first level (pre-structural) is personal to the learner and not the topic. The next three levels (unistructural, multistructural and relational) are relevant to the area of focus and share similar characteristics. The last level (extended abstract) is more general and extends beyond the previous levels in an appropriate abstract way.

Number of Organizing Dimensions: The first level does not have an organizing dimension relevant to the activity or question. For the next three levels the organization is based on one dimension, several independent dimensions, and an integration of the independent dimension. The final level moves beyond the previous by adding an overarching general framework encompassing the earlier work.

Consistency: The first level is the most inconsistent. This encompasses the information provided and the response provided. The next two levels provide growing consistency as more elements are used in determining a response. The relational level response is consistent within the internal or provided context of the learner. The extended abstract level response not only is able to work within the internal context but can also consider external principles or other contexts providing a much deeper and often more nuanced response.

Openness of Conclusion: The list of levels demonstrates a graduation of thinking from 'closed' to 'open'. 'Closed' is where learners respond very quickly to an activity or stimulus, sometimes without even understanding the question. As a learner offers increasing levels of response, there is more time and consideration provided, i.e., the response becomes more 'open' so as to enable more room for considered interpretations. This 'openness' is maximized for extended abstract responses.

Sequence of Levels: The levels are developmental with an earlier level being a building block for the next level. A unistructural response is within the related multistructural response. A relational response integrates the elements of the earlier multistructural response. An extended abstract response has within it the relational response but extends it through embedding the response within a broader external environment or through incorporating broader principles or theoretical positions.

Part 4 The SOLO Model and Instruction

The strength of the SOLO model is the linking of the hierarchical nature of cognitive development through the modes (not mentioned in this Summary) and the cyclical nature of learning through the levels.

In terms of SOLO levels, each level provides building blocks for the next higher level. SOLO also provides teachers with a common and shared language that enables them to describe in a meaningful way their observations of student performance. This is particularly important when teachers try to articulate differences between lower-order and higher-order skills and understandings.

Emerging from careful research work of SOLO is the observation that while the lower levels in the SOLO model can be taught in the traditional sense. The shift to developing learner higher-order skills and for them to be able to respond to questions with higher-order responses requires a quality in the thinking of the learner that cannot be guaranteed by explicit teaching alone.

There appears to be certain teaching approaches and strategies that might be better applied when students are identified as responding at one SOLO level than when at another. Knowledge of this pattern can better help teachers develop a rationale for their actions and help inform the nature of their instruction to targeted groups.

Part 5 Final Comment

Overall, it has been clear that for the great majority of teachers, assessment in subjects taught in school are dominated by a focus on content (in the form of facts) and skills (associated with computational techniques), and the ability of learners to reproduce these on demand. This narrow focus can have a sterile effect upon innovations and developments in the English/Reading curriculum and even on what it means for a person to think.

The issue here for teachers is about

   (i)   interpreting the quality of the learning in terms of 'how well' material is understood (Biggs & Collis, 1982; 1991); and,
   (ii)   selecting the most appropriate strategies, procedures or teaching activities for their students at their SOLO response level.

Higher-order goals of learning, such as judgement formation, solving relevant problems, and on developing understanding, must encompass not only the content, but also the interrelationships between various processes and procedures.

Nevertheless, these more demanding skills and developments must be built on fundamental lower-order knowledge, skills and understandings. Quality education, instruction and learner outcomes, must embrace the full range of abilities as described and categorized through the SOLO model in the topics identified.

Activity 3 LAC Session on Background to HOTS in the Classroom

LAC Objectives: At the end of this 1.5-hour LAC session, teachers would be able to:

a. summarize the PISA 2018 results of Filipino learners;
b. define higher-order thinking skills (HOTS);
c. identify which strand in the PPST promotes HOTS; and
d. appreciate how the assessment items in the teacher's resource can help promote higher-order thinking skills.

BEFORE THE SESSION
✓ Inform teachers about the schedule, topic, and objectives of the session and ask them to read the Executive Summary of https://www.deped.gov.ph/wp-content/uploads/2019/12/PISA-2018-Philippine-National-Report.pdf;
✓ Confirm who will serve as the documenter, preferably on a rotating basis;
✓ Prepare the venue and necessary equipment, such as a laptop and/or projector (if face to face);
✓ Ensure that the seating arrangement during the LAC session complies with physical distancing protocols (if face-to-face). Alternatively, an agreed platform can be set up if the session will be conducted online. Make sure that the selected platform is accessible to all LAC members;
✓ If the LAC session is online, make sure to share guidelines for conducting online meetings (e.g., find a quiet place in your home where you can focus, mute your mic when not speaking, etc.). Prepare slides needed for the session.

DURING THE SESSION

1. **Pulse check (10 minutes)**

    - **8 minutes:** Start the LAC session with the following check-in questions: *What is something that worries you about your students as learners? How do you deal with that worry?*

    - **2 minutes:** Check/summarize if there are common worries and common ways of dealing with them.

2. **Introduction of topic (5 minutes)**

    - Ask teachers who among them have read the Executive Summary of *PISA 2018: National Report of the Philippines*. If most of them have read the Executive Summary, ask them to pair up and share with each other how they felt while reading the Executive Summary. If only a few have read it, ask them to pair up and quickly go over the summary together.

3. **Activity (65 minutes)**

    - **5 minutes:** Given what they read, ask the teachers to reflect: *Since the PISA does not assess how well learners remember facts but how they are able to interpret texts, solve mathematics problems, or explain phenomena scientifically using their knowledge and reasoning skills (higher-order thinking skills (HOTS)), how do we define HOTS as teachers? Given our HOTS definition/s, what do we need to do as teachers to help our learners develop their HOTS?*

    - After teachers reflect on their own, views show these definitions from the *PPST Resource Package Module 3* (on the board, manila paper or on a slide):

        - CREATIVE THINKING SKILLS: These are thinking skills that involve exploring ideas, generating possibilities and looking for many right answers rather than just one.

        - CRITICAL THINKING SKILLS: These are high level thinking skills such as analysis, evaluation, interpretation, or synthesis of information and application of creative thought to form an argument, solve a problem, or reach a conclusion.

        - HIGHER-ORDER THINKING SKILLS: These are complex thinking processes which include analysis, evaluation, synthesis, reflection and creativity.

    - **25 minutes:** Ask the teachers to discuss the following in groups of 4 to 5: *Are the definitions of creative thinking skills, critical thinking skills, and HOTS from the PPST Resource Package similar to our their own definitions? What are the similarities and differences? Given the HOTS definition/s, what do we need to do as teachers to help our learners develop their HOTS?*

- **10 minutes:** Ask a representative from each group to quickly share the highlights of the group discussion. Limit each sharing to a few minutes.

- **5 minutes:** Summarize the group sharing. Connect comments to PPST Strand 1.5 (*Strategies for developing critical and creative thinking, as well as other higher-order thinking skills*) and on what teachers need to do to develop learners' HOTS. Emphasize that teachers need to apply a range of strategies for developing HOTS not just to improve PISA scores but also to ensure that learners are able to "build a reliable compass and the navigation tools to find their own way through an increasingly volatile, uncertain and ambiguous world" (Schleicher, 2019). By developing learners' HOTS, we help learners think for themselves and collaborate with others meaningfully, in work and citizenship.

- **5 minutes:** Introduce the *Teacher's Resource* by saying that the resource "is designed to set up instructional support for you to assist the effective implementation of teaching strategies in helping learners develop higher-order thinking skills through the PPST Strand 1.5" by providing items or activities that can be used as examples when explaining/reviewing a concept or as test items.

- **5 minutes:** Distribute the *Teacher's Resource* and ask the teachers to go through the first three items for the grade level they are teaching.

- **5 minutes:** Ask the teachers about their impressions of the items. Tell them, "Don't mind the terms unistructural, multistructural, and relational for now. We will discuss that in another LAC session."

- **5 minutes:** Ask the teachers whether they think the items can help develop learners' HOTS and why they think so/don't think so.

- Mention that in the next LAC session, teachers will consider more items and you will be introduced to how the items are structured and what "unistructural, multistructural, and relational" mean. As homework, please read the Introductory pages of the *Teacher's Resource*.

- Close the session by thanking the teachers for their contributions and active participation. Say that you hope to have that same level of enthusiasm in the next LAC session.

AFTER THE SESSION

- ✓ Remind teachers to read Introductory pages of the *Teacher's Resource* (from the cover to *What teachers can expect from this Resource Material*) a few days before the second LAC session.

- ✓ Remind teachers of the schedule (and modality) of the next LAC session and give them the necessary details should the session be online.

Activity 4. Auditing SOLO-based Lesson Plan

After guiding your mentee(s) in formulating SOLO questions, it's time to help them integrate those questions into lesson delivery using the approaches mentioned in the *Teacher's Resource.*

In the succeeding suggested activity, you will guide your mentees in auditing SOLO-based lesson plans while applying the QAR strategy in teaching. This may include (1) determining the type of questions based on the QAR strategy; (2) determining the level of questions based on the SOLO model, and (3) assessing the plan based on the characteristics of the QAR approach (Duke & Pearson, 2002).

This figure summarizes the explicit teaching model as described by Duke & Pearson (2002).
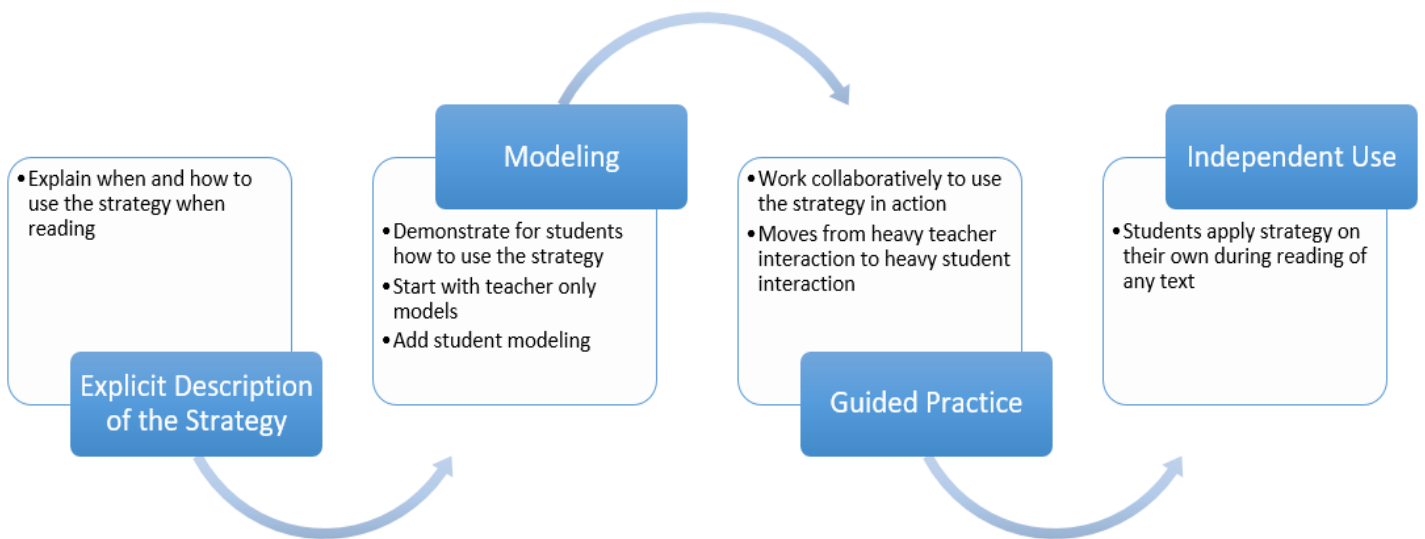

Figure 1. Explicit Teaching Model

Competency	The learners should be able to: **PISA:** Scan a single text in order to retrieve target information made of a few words, phrases, or numerical values. **K to 12:** Scan for needed information (EN10RC-IId-1.5.2)
Text	Dreams by *Langston Hughes* Hold fast to dreams For if dreams die Life is a broken-winged bird That cannot fly. Hold fast to dreams For when dreams go Life is a barren field Frozen with snow.

Procedure	Annotation (HOTS – Approach, SOLO)	Level of Questions in QAR
Explicit Description of the Strategy: *(Explain when and how to use the strategy when reading)* 1. Ask the students to read and analyze the given text/graph. Ask the students to create and write down questions that are related to the text. 2. Start introducing **QAR** with the different question types (**Right There, Think and Share, Author and Me,** and **On My Own** Questions) Also, incorporate the **QAR** strategy to the **HOTS SOLO**.	Instructions: Read carefully the poem, Dreams, written by Langston Hughes, and answer the questions that follow. *(Unistructural)* 1. The answer is in one particular place in the text. You can look for key words used in the question. *(Multistructural Approach)* 2. The answer may be found in more than one place in the text. There is a need to put the information together. *(Relational Approach)* 3. The answer may not be entirely found in the text. You need to think about what you already know, what the author tells you, and how it fits together. *(Extended Abstract)* 4. The answer may not be found in the text at all. you need to use your own ideas and experiences to help you answer the question.	1. Right There 2. Think and Search 3. Author and Me 4. On My Own
Modeling: *(Demonstrate for learners how to use the strategy; start with the teacher only models; add student modeling)* **3.** Provide an example. Using the given text "***Dreams***" give different types of questions using the **QAR strategy**. Explain how to come up with the answers for each question type (**Right**	Demonstrate to the learners what they must do. Give clear and systematic instruction on what and how to do it, by giving an example using the HOTS SOLO approach. **Sample Question:** 1. What happens when dreams die? (Unistructural)	*1. Right There*

| **There, Think and Share, Author and Me**, and **On My Own** Questions). | 2. Enumerate the two metaphors on life stated in the poem. (Multistructural)

3. How does the poet use the images of the bird and the field to make the argument that life without dreams is not worth living? (Relational)

4. Suggest other images that the poet could use to depict the same idea of the poem. (Extended Abstract) | 2. *Think and Search*

3. *Author and Me*

4. *On My Own* |

Procedure	Annotation (HOTS – Approach, SOLO)	Level of Questions in QAR
Guided practice: **4.** After learners have been introduced to the **QAR** concepts, provide them with another reading passage, *"The Road Not Taken"* by Robert Frost. (You may refer to the *Teacher's Resource* for the copy of the text.) Give questions using the sample items that are incorporated with the HOTS SOLO approach. Let the learners answer the questions, and identify the type of question used. The learners can use their answers in the questions for them to be able to identify the type of question used. You can either ask learners to do this activity individually or in a group. Encourage learners to explain their thinking and should continue to give immediate feedback.	Questions/Activities: 1. Determine which line in the poem best portrays the author's need to make a choice. (Unistructural) 2. Identify lines from the poem showing that the traveler has difficulty choosing which path to take. (Multistructural) 3. What particular attitude of the author is implied in the following lines, "I took the one less traveled by, and that has made all the difference?" Justify your answer. (Relational) 4. If you were to choose between the roads, which path would you take? (Extended Abstract)	*1. Right There* *2. Think and Search* *3. Author and Me* *4. On My Own*
Independent use: **5.** Give your learners another reading passage. Assign this activity by pair or by dividing the class into smaller groups. Each pair/group should make or answer the given activity/questions	Instructions: 1. Read and understand the given passage with your group/partner. 2. Write down four questions about the passage following the QAR strategy incorporating the HOTS SOLO Approach. 3. Write also the answers to each question. Categorize each with the QAR relationship and HOTS SOLO Approach. Prepare a brief explanation of it for the class.	

Mentoring Points:
- The competencies used are for Grade 10.
- Advise your mentee(s) that this can be taught to a lower level, Grade 8, for instance, by simplifying the text and the level of difficulty of the questions/activities.
- This illustration utilized QAR Strategy.
- Combined with SOLO, they may also consider applying other teaching strategies like Guided Reading, especially for lower grade levels, contextualizing their activities.

HANDS-ON ACTIVITY

Ask your mentee/s to work on the matrix.

Competency	
Text	

Procedure	**Annotation** (HOTS – Approach, SOLO)	**Level of Questions in QAR**

Explicit Description of the Strategy:

Procedure	Annotation (HOTS – Approach, SOLO)	Level of Questions in QAR
Modeling:		
Guided practice:		
Independent use:		

REFLECTION LOG

Ask your mentee to reflect on his/her experiences in adapting the SOLO. Use the following guide:

1.   Describe your understanding of the SOLO model?

2.   Describe your experiences in integrating SOLO in your teaching practice? Discuss any positive experiences.

3.   What challenges have you encountered in integrating SOLO in your practice?

4.   How did you address those challenges?

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